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## **ANALYTICAL STUDIES ON OVERALL DISTRIBUTION OF EARTHQUAKE-INDUCED LANDSLIDES IN MOUNTAINOUS DISTRICTS AT THE TIME OF 2015 NEPAL GORKHA EARTHQUAKE**

### **Summary:**

*The 3D dynamic elasto-plastic finite element method is applied to simulate overall distribution of earthquake-induced slope failures in mountainous districts in Nepal at the time of 2015 Nepal Gorkha Earthquake. The nonlinear stress-strain relationships of the materials in each slope are formulated as an elasto-plastic constitutive model formerly proposed by the authors, that has accommodated hyperbolic type of skeleton curves with sophisticated hysteric curves considering appropriate dynamic deformation characteristics of such materials. The investigated area in this study are the following two cases of undulating districts in Nepal; i.e., (1) headwall slopes in the hanging glacier in the Langtang valley in the higher Himalaya where ice and rock avalanches struck the hillside village, and (2) mountainous slopes in Sindhupalchowk district locating in transition zone between the higher and lesser Himalayas. According to the comparisons of results between the simulated and observed results in each area, it can be concluded that the proposed analytical method can be possibly utilized for predicting overall distribution of earthquake-induced landslides which would be helpful for developing landslide susceptibility maps in mountainous districts in Nepal.*

### **Keywords:**

*Nepal, Earthquake, Slope failure, Finite element method, Seismic response analysis, Elasto-plasticity.*

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